

## CHAPTER IX.

## ON UNCONFORMABLE TRAP ROCKS AND BASALTIC DYKES.

Different Positions of Trap Rocks, as overlying, imbedded in, or intersecting other Rocks.—Varieties of Trap Rocks.—Porphyry, Porphyritic Trap, Sienite, Greenstone, Clinkstone, Basalt, Amygdaloid, and Wacke.—Passage by Gradation into each other, and into Volcanic and Granitic Rocks.—Remarkable Instance of this Passage at Christiania in Norway.—Mountains of Porphyritic Trap and Clinkstone with deep Craters.—High Stile, Cumberland, Cader Idris, Monmouthshire.—Basaltic Dykes: Extent of the Cleveland Basalt Dyke.—Isolated Caps of Basalt.—On interstratified Basalt.—Remarks of Professor Sedgwick on the Protrusion of Basalt between regular Strata.—On columnar Ranges of Basalt.—Organic Remains enveloped in Basalt.—Remarkable Basaltic Districts in Europe and America.—Experiments on Basalt.—Theory of Werner. On the relative Age of Trap Rocks.

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*The class of rocks about to be described in the present chapter, are extremely interesting to the geologist, as they present him with decided indications of their origin and mode of formation. They not only "reveal the secret of their birth," but, from their close alliance to many of the most ancient primary rocks, they disclose the operations by which a large portion of the earth's surface was consolidated, in the most remote geological epochs. Many of the trap rocks are so similar in structure and composition to the products of active volcanoes, and to beds of lava erupted in our own times, that we may be said to see the very cause in operation, by which they were formed. Many of the trap rocks are also so similar in structure and composition to some of the most ancient primary rocks, that we can scarcely doubt respecting their having had the same origin, though they may have been consolidated under different degrees of heat or pressure, and with different attendant conditions. The name Trap is derived from the Swedish word trappa, a stair, and has been given to rocks, of this class, because many of them divide into regular forms resembling the steps of stairs. Whether the term, in its literal sense, is well chosen as a generic name, may be doubted; but, taken metaphorically, it is extremely appropriate, as these rocks offer a series of gradations or steps, over which the geologist may safely travel in his speculations, from the lava of Etna, to the granite of the Alps.*

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To obtain a correct knowledge of trap rocks, the student should first acquire a clear idea of their position. When primary and transition rocks form distinct beds, they are generally arranged conformably, or, in other words, the upper beds are moulded upon the lower, and have the same elevations and depressions, as represented Plate III. fig. 1.